APPENDIX B

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

SITE: Reasor Chemical
BREAK: 1a8
OTHER: VF

January 30, 2004

10118334

Ms. Teresa Offner
Site Manager
Weston Solutions, Inc.
5430 Metric Place, Suite 100
Norcross, GA 30092

Subject: Final Design Submittal (Revision 0) - Approval
Reasor Chemical Company Site – Remedial Design
Work Assignment Number 147-RDRD-A424

Dear Ms. Offner:

I have reviewed the Final Design Submittal, Revision 0, dated January 9, 2004, which Weston Solutions, Inc. prepared for the Reasor Chemical Company Site. The start date for the Remedial Action Schedule will most likely be later than presented. Because there are numerous uncertainties regarding the actual remedial action start date, no revision is being requested and the submittal is approved as is.

Thank you for your assistance with this project. I have been impressed with your responsiveness and ability to complete this project on schedule and under budget. If you have any questions, please feel free to contact me at (404) 562-8760.

Sincerely,

Samantha Urquhart-Foster
Remedial Project Manager
North Site Management Branch

cc: Mr. David Mattison, NC DENR
Ms. Kelly Stynes, CH2M Hill
Ms. Pat Vogtman, EPA Region 5
Ms. Sara Ward, USFWS
Ms. Michel Gielazyn, NOAA

SITE: Reasor Chemical
BREAK: 6.3
OTHER: V1

REASOR CHEMICAL COMPANY
CASTLE HAYNE, NORTH CAROLINA
REMEDIAL DESIGN

FINAL DESIGN SUBMITTAL
Revision 0
January 2004

WORK ASSIGNMENT NO. 147-RDRD-A424

Prepared for

U.S. EPA Contract No. 68-W7-0026
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604

Prepared By: _____ Date: 12/22/03
Ralph P. McKeen, P.E.
Project Engineer

Approved By: _____ Date: 12/29/03
Mark Cramer, P.E.
Certifying Engineer

Prepared and
Approved By: _____ Date: 1/9/04
Teresa Offner, P.E.
Site Manager

Approved By: _____ Date: 1/9/04
for James M. Burton, P.E.
Program Manager

Document Control # RFW147-2F-AONI

INTERMEDIATE REMEDIAL DESIGN
CONSTRUCTION SPECIFICATIONS

TABLE OF CONTENTS

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section describes a summary of the Work to be completed for remedial cleanup actions at the Reasor Chemical Company Site.

1.2 DEFINITIONS

A. RCC: Reasor Chemical Company Site.

B. CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act.

C. RCRA: Resource Conservation and Recovery Act.

D. US EPA: United States Environmental Protection Agency, Region 4

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The completed Work encompasses the remedial construction activities at the Reasor Chemical Company Site (RCC) in accordance with CERCLA. The RCC is a former stump rendering facility, which operated from 1959 to 1972. The 25-acre property is currently vacant with unpaved roads along the inner periphery of the property and throughout the site. The site is currently overgrown with brush and second growth forest. In September 2002, US EPA issued the Record of Decision (ROD) for the selected remedy based on the remedial investigation and focused feasibility study.

B. The remedial construction work includes removal of surface water from four onsite ponds, removal of sediment within each of these ponds and backfilling the pond areas with clean fill material to surrounding grades. In addition, three soil areas will be remediated by excavation of surface soil and restored to existing site conditions. All contaminated media (surface water, sediment, and soil) will be transported off site to a permitted disposal facility. Soil areas and ponds to be remediated are shown on the Remedial Construction Plans.

C. The contaminants observed in the surface water, soil, and pond sediments and respective cleanup goals as prescribed in the ROD are included in the following table:

Soil/Sediments	Highest Observed Concentration	Remedial Cleanup Goal
PAHs:		
Benzo(a)pyrene	9.5 mg/kg	0.610 mg/kg
Benzo(b and/or k) flouranthene	11.8 mg/kg	6.100 mg/kg
Dibenzo(a,h)anthracene	0.930 mg/kg	0.610 mg/kg
Metals:		
Antimony	370 mg/kg	30 mg/kg
Copper	99,000 mg/kg	2,700 mg/kg
Lead	2,100 mg/kg	400 mg/kg
Surface Water		
Metals:		
Copper	110 ug/l	7 ug/l
Iron	13,000 ug/l	1000 ug/l
Lead	35 ug/l	2.5 ug/l
Zinc	180 ug/l	50 ug/l

D. The work does not include the sampling of the existing groundwater monitoring well network.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01020

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 LUMP SUM PAY ITEMS

A. Work under this contract that will be fixed price includes the following work items:

1. Mobilization and demobilization
2. Plan preparation
3. Permits and government approvals
4. Erosion and sediment control
5. Site health and safety
6. Equipment and personnel decontamination
7. Site security
8. Site cleanup and restoration (including on site borrow area)

B. All costs associated with these items will be paid as part of the lump sum agreement. The lump sum price the items listed shall include all facilities, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protections, meeting safety requirements, test and reports, and for performing all work required for which separate payment is not otherwise provided. Payment shall be made on a percentage completion basis, of the lump sum amount shown on the Bid Schedule Form.

1.2 UNIT RATE PAY ITEMS

A. Unit rate pay items under this contract include the following:

1. Excavation and handling of contaminated soil
2. Excavation and handling contaminated sediments
3. Backfill of excavated soil and pond areas
4. Removal, transportation and disposal of contaminated surface water

B. Excavation and handling of contaminated soil

This unit rate pay item consists of excavation, staging, sampling, and disposal of soil from the three (3) soil areas as shown on the Construction Plans and described in the Specifications. This item includes all plans, laboratory testing, permits, fees, taxes, quality control, health and safety, and all other items to perform the work. Measurement for payment shall be based on the actual number of tons of contaminated soil removed from the site and disposed of in an approved Subtitle D Landfill. Landfill weigh tickets will be used to determined pay

quantities. The unit price shall include all excavation, loading, staging, verification sampling and laboratory analysis, hauling, tipping fees, and other incidental costs.

C. Excavation and handling of contaminated sediments

This unit rate pay item consists of excavation, staging, and sampling sediment from the four (4) ponds as shown on the Construction Plans and described in the Specifications. This item includes all plans, laboratory testing, permits, fees, taxes, quality control, health and safety, and all other items to perform the work. Measurement for payment shall be based on the actual number of tons of contaminated sediment removed from the ponds and disposed of in an approved Subtitle D Landfill. Landfill weight tickets will be used to determine pay quantities (tonnage). The unit price shall include all excavation, verification sampling and laboratory analysis, hauling, tipping fees, and other incidental costs.

D. Backfill of excavated soil and pond areas

This unit rate pay item consists of backfilling the excavated soil areas and ponds with clean borrow material to match surrounding grades as shown on the Construction Plans and described in the Specifications. Measurement for payment shall be based on the actual number of in-place cubic yards of on-site backfill, placed, and compacted on-site. Surveyed volumes (measured to the nearest 0.10 ft) of completed fill areas shall be used to determine the in-place volume. The unit price shall include all excavation and hauling from the on-site borrow source, placement and compaction, and other incidental costs.

E. Removal, transportation and disposal of contaminated surface water

This unit rate pay item consists of removal of approximately 344,000 gallons of contaminated surface water from the four (4) on-site ponds, transportation, and final disposal at a permitted treatment facility. Measurement for payment shall be based on the actual number of gallons removed from the ponds and as measured using a certified totalizing flow meter on the tanker transport. Certified tickets from the disposal facility will be used to determine pay quantities. This unit price shall include all pumps, secondary containment, loading, treatment costs, disposal sampling and laboratory analysis and other incidental costs.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01040

COORDINATION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section describes the major aspects of the Work that must be coordinated with outside parties during the remediation construction activities.

1.2 RELATED WORK AT SITE

A. General:

All work related to this project is being performed as a CERCLA remedial action. The lead agency is the U.S. EPA in Region 4 with assistance from the North Carolina Department of Environment and Natural Resources (NC DENR). The following contacts for the appropriate agency are provided:

1. Agency and Contact Person:

a. U.S. EPA Region 4
Samantha Urquhart-Foster, Remedial Project Manager
(404) 562-8760
urquhart-foster.samantha@epa.gov

b. North Carolina Department of Environment and Natural Resources
David Mattison
(919) 733-2801, ext. 349
david.mattison@ncmail.net

B. Potable Water/Power/Telephone:

There are no active utilities present on the site. The Contractor will be responsible for identifying the need for utilities and acquiring these services.

1.3 UTILITY NOTIFICATION AND COORDINATION

A. Coordinate Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during Work.

1.4 REFERENCE POINTS AND SURVEYS

A. Location and elevation of benchmarks are shown on Drawings.

B. Contractor's Responsibilities:

1. Provide additional survey and layout required to lay out the Work.
2. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
3. Retain professional land surveyor or civil engineer registered in the State of North Carolina who shall perform or supervise engineering surveying necessary for additional construction staking and layout.
4. Maintain complete accurate log of survey Work as it progresses as a Record Document.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes general requirements and procedures related to the Contractor's responsibilities for preparing and transmitting submittals to the EPA or EPA Project Representative to demonstrate that the performance of the work will be in accordance with the Contract requirements. Submittals include schedules, test results, Contractor's drawings, samples, work plans, methods of construction, and record drawings.

1.2 SUBMITTAL REQUIREMENTS

A. Not later than 30 days after the receipt of Notice to Proceed, the Contractor shall submit a Remedial Action Work Plan for EPA review and approval. No work on-site shall commence until formal written approval is provided to the Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 REMEDIAL ACTION WORK PLAN

A. The Remedial Action Work Plan shall detail the approach to the implementation of the designed remedial action. The work plan shall include the following items at a minimum:

1. Identification of the RA Team, key personnel, description of duties, and lines of authority in the management of the construction activities.
2. Schedule for the remedial action and process for updates throughout the project.
3. A Health and Safety Plan for field construction activities as described in Section 01350.
4. A Contingency Plan for spill prevention and other adverse conditions and a strategy for implementation.
5. Procedures for data collection during the remedial action to verify cleanup levels and disposal characterization.
6. Project closeout activities.

3.2 CONSTRUCTION SCHEDULE

A. Along with the RA Work Plan, the Contractor shall submit an "expanded" construction schedule showing the order in which the Contractor proposes to carry out the work and the dates upon which he proposes to start and complete each major work item. The expanded schedule shall be an elaboration of the bid schedule with completion dates remaining unchanged. The schedule shall show each major work item with usage of the entire contract time provided in the contract, and shall include the dates for submittals, sample testing, approval of materials and Contractor's drawings, and the procurement of materials and equipment. The construction schedule shall be in chart form showing contemplated completion percentages and arranged to record actual completion percentages at stated intervals. The schedule will outline in detail the proposed equipment, manpower, and production rates necessary to achieve the schedule. The Contractor shall update the schedule every 2 weeks with any and all changes in equipment, manpower, etc. annotated.

B. The accepted construction schedule shall be kept up-to-date as work progresses, including work added by change order, and shall be submitted to the EPA Project Representative every 2 weeks and with the request for payment. If the Contractor fails to submit the required updated schedule within the time prescribed, the EPA Project Representative may withhold approval of progress payment estimates until such time as the Contractor submits the required current updated schedule.

3.3 CONSTRUCTION DRAWINGS

A. The Contractor's drawings shall be neat in appearance, legible, and explicit to enable proper review to ensure contract compliance. If the Contractor's drawings deviate from the Contract Documents, the Contractor shall advise the EPA Representative in writing with the submittal and state the reason therefore.

3.4 METHOD OF CONSTRUCTION

A. When so specified or directed by the EPA Project Representative, submit proposed method of construction for specific portions of the work for review and approval. This submittal shall include a detailed written description of all phases of the construction operation to fully explain to the EPA Project Representative the proposed method of construction. If required by the specifications, submit installation drawings to supplement the description. Review and approval by the EPA Project Representative will be in accordance with approval process herein and shall not relieve the Contractor from his responsibility with regard to fulfillment of the terms of the contract. All risks associated with the proposed method remain the Contractor's responsibility, and therefore the EPA Project Representative shall have no responsibility. After review and approval, if, in the opinion of the Contractor, modifications are necessary, submit such modifications in detail, including reasons for the modifications. Modifications shall not be implemented without review and approval by the EPA Project Representative.

3.5 SAMPLES

A. General - The Contractor is required to assist in the procurement of samples for testing to verify that they meet the requirements of these specifications. The costs of sample testing for cleanup verification purposes shall be borne by the Contractor. These certified test results will be submitted by an independent, NC DENR-certified analytical laboratory to the EPA Project Representative for approval of the material.

B. Approval Process - All sample results must be transmitted to the EPA or EPA Project Representative for review and approval. Work, such as backfilling, shall not proceed until final approval of verification sampling has been given.

3.6 RECORD DRAWINGS

A. The Contractor shall keep one record copy of all Contract Documents at the site in good order and annotated to show all revisions made during construction. Such annotations shall be kept current and may be inspected by the EPA Project Representative at any time. Failure to maintain current record drawings will be cause to delay progress payments. Record drawings shall be available to the EPA Project Representative at all times during the project.

END OF SECTION

SECTION 01350

ENVIRONMENT, HEALTH, AND SAFETY

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes general requirements and procedures related to the Contractor's responsibilities for preparing and implementing the Contractor's Health and Safety Program. This section also provides the specifics for a Site Health and Safety Plan.

1.2 SUBMITTAL REQUIREMENTS

A. Not later than 30 days after the receipt of Notice to Proceed, submit in writing the Site Health & Safety Plan. Both EPA and the EPA Project Representative will review this plan for consistency with current regulations and standard work practices.

B. In addition, the following shall be submitted during the course of the project to document health and safety controls:

1. Exposure Monitoring and Air Sampling Report
2. Site Control Log
3. Exposure Monitoring
4. Daily Site Entry and Exit Log

Copies of these submittals shall be maintained on site during the course of the project.

1.3 REGULATORY REQUIREMENTS

A. Work to be performed under this contract will comply with all applicable Federal, state, and local safety and occupational health laws and regulations. Included in this requirement is the Occupational Safety and Health Administration (OSHA) standards, 29 CFR 1910, particularly Section .120 " Hazardous Waste Site Operations and Emergency Response" and 29 CFR 1926, Section .65.

1.4 HEALTH AND SAFETY PROGRAM

A. OSHA Standards 29 CFR 1910, Section .120 and 29 CFR 1926, Section .65 require employers to develop and implement a written Health and Safety Program for employees involved in hazardous waste operations. The site Environmental Health and Safety Plan (EH&S) will interface with the employer's overall health and safety program.

1.5 SITE ENVIRONMENT HEALTH AND SAFETY PLAN

A. Preparation and Implementation

A Site Environmental Health and Safety Plan (EH&S) shall be prepared covering all work to be conducted by the Contractor and all subcontractors at the Reasor Chemical Company site.

B. Acceptance and Modifications

Prior to submittal, the EH&S plan shall be signed and dated by the Site Health and Safety Officer (SHSO) and the Project Manager. If any unforeseen hazards become evident during construction, the SHSO shall bring such hazard to the attention of the Project Manager and EPA or EPA's designated representative.

1.6 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

An organization structure shall be developed that specifies the lines of authority, responsibilities, and communication procedures concerning site environmental health and safety issues. The organizational structure shall cover management, supervisors and employees of the Contractor and subcontractors. The structure shall include the means for coordinating and controlling work activities of the subcontractors and suppliers.

A. Site Manager

The Site Manager, who has the responsibility to implement the EH&S Plan, the authority to direct work performed under this contract and verify compliance, shall be designated. The Site Manager shall have at least 5-years experience as a Site Manager of similar remedial action projects.

B. Site Health and Safety Officer

The Site Health and Safety Officer (SHSO) shall be responsible for the day-to-day on-site implementation of the EH&S Plan. The SHSO shall be assigned full time to the site and will have no duties other than health and safety related duties. If operations are performed during more than 1 work shift per day, a SHSO will be present for each shift.

The SHSO shall have the authority to ensure site compliance with specified safety and health requirements and all aspects of the EH&S Plan including: activity hazard analysis, air monitoring, use of PPE, decontaminations, site control, engineering controls, and preparation of records by performing daily health and safety inspections and documenting results on an inspection log.

The SHSO shall have minimum of 2 years experience in implementing health and safety programs at hazardous waste sites where Level C PPE was required. The SHSO must have experience in construction safety procedures and a working knowledge of Federal and state occupational health and safety regulations.

C. Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency shall be on-site at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but shall be immediately available to provide first aid or CPR when needed.

1.7 TRAINING

A. Personnel shall receive training in accordance with the Contractor's written health and safety training program and 29 CFR 1910.120, 29 CFR 1926.65, and 29 CFR 1926.21. The Environmental Health and Safety Plan (EH&S Plan) shall include a description of these training requirements. For each site worker, certificates of completion of the OSHA 40-hour health and safety training or 8-hour annual refresher, whichever is more current, shall be maintained on-site and included in the EH&S Plan.

1.8 PERSONAL PROTECTIVE EQUIPMENT

A. In accordance with 29 CFR 1910.120 (g)(5) and 29 CFR 1926.65 (g)(5), a written personal protective equipment (PPE) program addressing the items listed in these regulations, and which complies with respiratory protection program requirements of 29 CFR 1910.134, shall be included in the Contractor's Health and Safety Program. The EH&S Plan shall detail the minimum PPE requirements (including respirators) for each site-specific task and operation to be performed at the site based on the hazard risk analysis. Certification of fit-test must be maintained on-site and included in the EH&S Plan for site workers that may be required to wear respirators during the remedial action.

1.9 SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

A. The EH&S Plan shall describe the standard operating safety procedures, engineering controls and safe work practices to be implemented for the work covered.

1.10 SITE CONTROL MEASURES

A. To prevent the spread of contamination and control the flow of personnel, vehicles, and materials into and out of work areas, site control measures shall be established and detailed in the EH&S Plan.

1.11 SITE CONTROL LOG

A. The Contractor shall maintain a log of personnel visiting, entering, or working on the site on a daily basis. The log shall include the date, name, agency or company, time entering and exiting the site, and PPE utilized.

1.12 SITE SECURITY

A. The site has one point of access from State Route 132. This site entrance has a gate that shall be locked and posted as restricted areas when no activity is occurring at the site.

1.13 PERSONAL HYGIENE AND DECONTAMINATION

A. Personnel entering the Exclusion Zone or Contamination Reduction Zone or otherwise exposed or subject to exposure to hazardous materials shall perform decontamination as detailed in the EH&S Plan.

1.14 EQUIPMENT DECONTAMINATION

A. Vehicles and equipment used in contaminated areas shall be decontaminated in the Contamination Reduction Zone prior to leaving the site. The specific procedures for decontamination of vehicles and equipment shall be described in the EH&S Plan. The procedures shall include the manner in which decontaminating liquids are contained and handled for proper disposal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes requirements of a general nature related to the Contractor's responsibility for quality control involving meetings, inspections, tests, certificates, and reports.

1.2 PROJECT MEETINGS

A. In order to successfully complete the work, it will be necessary for the Contractor and EPA Project Representative to have formal, structured communications on a regular basis. This will be accomplished through meetings held during the progress of the work, each of which shall be documented by the Contractor and submitted to the EPA Project Representative.

1.3 PRE-CONSTRUCTION MEETING

A. A pre-construction meeting will be held at the site prior to the start of major construction activities. The EPA Project Representative or his designee and the Contractor will attend the meeting to review remedial construction plans and documents. This meeting shall take place at least 1 week prior to the start of construction and will be coordinated by the Contractor.

The objectives of the pre-construction meeting are:

1. Review the responsibilities of each organization.
2. Review lines of authority and communication for each organization.
3. Discuss the established protocol for observations and tests.
4. Discuss the established protocol for handling construction deficiencies, repairs, and retesting.
5. Review methods for distributing and reporting field monitor data.
6. Review work area security and safety protocol.
7. Discuss any modifications of the Remedial Action Work Plan to ensure that site-specific considerations are addressed.
8. Discuss procedures for the protection of materials and for the prevention of damage from inclement weather or other events.
9. Conduct a site walk to verify that the design criteria, specifications, and drawings are understood and to review material and equipment storage locations.

1.4 PROGRESS MEETINGS

A. Progress meetings shall be held on a regular basis, preferably every week at the work site. The objectives of each meeting are:

1. Review the activities and accomplishments completed within the previous designated time period.
2. Review the work location activities and construction monitoring requirements for the ensuing week(s).
3. Identify the Contractor's personnel and equipment assignments for the ensuing period.
4. Discuss any potential construction problems.

1.5 PROBLEM OR WORK DEFICIENCY MEETINGS

A. Special meetings shall be held when a problem or deficiency has occurred or is anticipated by project personnel. The purpose of the meeting is to define and resolve the problem or recurring work deficiency in the following manner:

1. Define and discuss the problem or deficiency.
2. Review alternative solutions.
3. Implement a plan to resolve the problem or deficiency.

1.6 INSPECTIONS

A. The EPA Project Representative has the right to inspect all materials and equipment during the course of the remedial action, and shall be allowed access to the site to conduct such inspection. On-site work will be subjected to continuous inspection. Inspection by the EPA Project Representative will not release the Contractor from responsibility or liability with respect to material or equipment.

1.7 FIELD AND LABORATORY TESTING

A. All testing conducted to determine compliance with the project specifications shall be performed by a laboratory certified in the State of North Carolina. The laboratory must submit a quality control plan detailing the laboratory procedures used to maintain quality control. EPA may also conduct an inspection of the laboratory to audit the quality control practices.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01410

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section describes the Work required to prevent environmental pollution and damage as a result of construction operations.

1.2 GENERAL REQUIREMENTS

A. The Contractor shall perform the work minimizing environmental pollution and damage as the result of construction operations. Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the utility of the environment for aesthetic, cultural and/or historical purposes. The control of environmental pollution and damage requires consideration of land, water, and air, and includes management of visual aesthetics, noise, and solid waste, as well as other pollutants. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract.

1.3 LAND RESOURCES

A. The Contractor shall confine all activities to areas defined by the Drawings and Specifications. Prior to the beginning of any construction, the Contractor shall identify the land resources to be preserved within the work area. Except in areas indicated on the Drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without permission. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, earth or other material displaced into uncleared areas shall be removed.

B. Work Area Limits: Prior to any construction, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

C. Landscape: Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the Drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

D. Unprotected Erodible Soils: Earthwork brought to final grade shall be finished as indicated. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in cases where the constructed feature obscures borrow areas, quarries, and waste material areas, these areas shall not initially be totally cleared. Clearing of such areas shall progress in reasonably sized increments as needed to use the developed areas as approved by the Construction Manager.

E. Disturbed Areas:

1. The Contractor shall effectively prevent erosion and control sedimentation through approved methods including, but not limited to, the following:

a. Retardation and Control of Runoff: Runoff from the construction site or from storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, berms, and by any measures required by area wide plans under the Clean Water Act and as shown on the Drawings.

b. Erosion and Sedimentation Control Devices: The Contractor shall construct or install temporary and permanent erosion and sedimentation control features as indicated on the Drawings. Berms, dikes, drains, sedimentation basins, grassing, and mulching shall be maintained until permanent drainage and erosion control facilities are completed and operative.

F. Contractor Facilities and Work Areas: The Contractor's field offices, staging areas, and stockpile storage shall be placed in areas designated on the Drawings or as directed by the EPA Project Representative. Borrow areas shall be managed to minimize erosion and to prevent sediment from entering nearby waters. Spoil areas shall be managed and controlled to limit spoil intrusion into areas designated on the Drawings and to prevent erosion of soil or sediment from entering nearby waters. Spoil areas shall be developed in accordance with the grading plan indicated on the Drawings. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas from despoilment.

1.4 WATER RESOURCES

A. The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and groundwaters. Toxic or hazardous chemicals shall not be applied to soil or vegetation when such application may cause contamination of the fresh water reserve. Monitoring of water areas affected

by construction shall be the Contractor's responsibility. Tributaries leading to Prince George Creek are considered jurisdictional wetlands by the U.S. Army Corps of Engineers, and shall be delineated prior to the start of construction. Once delineated with the assistance of the EPA Project Representative, the Contractor must avoid disturbance in these areas. All water areas that could potentially be affected by construction activities shall be monitored by the Contractor.

B. Decontamination Water: Wastewaters directly derived from decontamination activities shall not be allowed to enter water areas. Decon water shall be collected and placed in temporary pools or retention ponds where suspended material can be settled out or the water evaporates to separate pollutants from the water. Analysis shall be performed and results reviewed and approved before water in pools or retention ponds is discharged or otherwise disposed in accordance with all local, state, and federal requirements. All sediments from decontamination activities shall be collected and disposed with contaminated soil and sediments at a properly permitted and licensed disposal facility.

C. Fish and Wildlife: The Contractor shall minimize interference with, disturbance to, and damage of fish and wildlife. Species that require specific attention along with measures for their protection shall be listed by the Contractor prior to beginning of construction operations.

1.5 AIR RESOURCES

A. Equipment operation and activities or processes performed by the Contractor in accomplishing the specified construction shall be in accordance with the State of North Carolina Air Quality rules and all federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency shall be maintained. Monitoring of air quality shall be the Contractor's responsibility. All air areas affected by the construction activities shall be monitored by the Contractor. Monitoring results will be periodically reviewed by the EPA Project Representative to ensure compliance.

B. Particulates: Dust particles, aerosols and gaseous by-products from construction activities shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling and chemical treatment of an approved type will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs.

C. Hydrocarbons and Carbon Monoxide: Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to federal and state allowable limits at all times.

D. Odors: Odors shall be controlled at all times for all construction activities, processing and preparation of materials.

E. Sound Intrusions: The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise.

1.6 WASTE DISPOSAL

A. Solid Wastes: Solid wastes (excluding clearing debris) shall be placed in containers, which are emptied on a regular schedule. Handling and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall comply with site procedures and federal, state, and local laws and regulations pertaining to the use of landfill areas.

B. Chemical Wastes: Chemicals shall be dispensed ensuring no spillage to ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Construction Manager. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be disposed of in accordance with federal and local laws and regulations.

C. Hazardous Wastes: The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing and shall collect waste in suitable containers observing compatibility. The Contractor shall transport hazardous waste and dispose of it in compliance with federal and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the EPA Project Representative. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility.

1.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

A. If during excavation or other construction activities any previously unidentified or unanticipated resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rocks or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the EPA Project Representative.

1.8 POST CONSTRUCTION CLEANUP

A. The Contractor shall clean up all areas used for construction.

1.9 RESTORATION OF LANDSCAPE DAMAGE

A. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work areas.

1.10 MAINTENANCE OF POLLUTION CONTROL FACILITIES

A. The Contractor shall maintain temporary pollution control facilities and devices for a period of one year or until such time that substantial vegetation is established as determined by the EPA.

1.11 BORROW MATERIAL

A. The Contractor shall perform chemical analyses of borrow material that will be used in backfill operations that are from sources off the Reasor Chemical Property unless already tested by the EPA.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes requirements for cleanup, as required, to protect all work in place, to stabilize and restore all disturbed areas, to remove all evidence of construction activities, and to effect completion of the contract in an orderly manner.

1.2 CLEANUP

A. Construction cleanup shall proceed as construction progresses and shall consist of the removal of all mud, oil, grease, soil, gravel, trash, scrap, debris, and excess materials that are unsightly or may cause the tripping or sliding of site personnel or equipment.

Immediately prior to the Contractor's written request for a final inspection of the contract work or any portion thereof, final cleanup tasks shall be performed. Remove all trash, debris, surplus construction material and surplus excavated material. No items shall remain on or be discarded on this site.

1.3 RESTORATION AND RESTABILIZATION

A. All areas disturbed by the Contractor's operation shall be restored and restabilized as specified herein. This shall include, but not be limited to, staging and stockpiling areas, construction strips, access to roads, and all areas within the limit of work.

Final restoration and restabilization shall proceed in accordance with the construction schedule. This shall include, but not be limited to, roadway restoration, and temporary erosion control measure removal. All temporary erosion control measures shall be maintained for a period of one year or until such time that vegetation has been established. Disassemble and remove all temporary construction facilities constructed by the Contractor and leave the site in an orderly and restored condition as required by the Contract Documents.

Preserve existing signs, markers, guard rails, and fences and maintain in their existing locations and condition unless written permission is obtained from the EPA for their removal and subsequent restoration or replacement. Remove such conflicting facilities when grading operations begin and store in a manner to keep them clean and in their existing condition. Restore to their pre-construction locations before demobilization or such new locations as directed. Repair or replace damaged items when directed, at no cost to the EPA.

Revegetation shall be performed in accordance with Section 02233.

Gravel surfaces and access road shoulders shall be restored as near as practicable to their condition prior to being disturbed. Replace material not able to be reused with new material of same quality and gradation. Materials and methods of construction shall be in accordance with specification requirements and with applicable permits secured for this Contract.

1.4 DISPOSAL OF WASTE AND EXCESS MATERIALS

A. Construction waste and excess construction materials shall be disposed of as directed by the EPA Project Representative.

Waste and excess material disposed of in an unauthorized area shall be removed by the Contractor and the area shall be restored as near as practicable to its condition before disturbance, at no cost to EPA.

1.5 REMOVAL OF CONDEMNED MATERIAL

A. Material delivered to the contract site, which has been determined by the EPA Project Representative to be unsuitable or not in accordance with the Contract Documents shall be removed from the work site at no cost to the EPA.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

A. Upon receiving the Contractor's written request for substantial completion inspection, the EPA Project Representative will perform a walk through of the site area with the Contractor. The walkthrough shall identify and document (via a punch list) the additional construction items required to declare the site area "substantially complete." If, in the opinion of the EPA Project Representative, the site area can be fully utilized for purposes for which it was intended, a "Certificate of Substantial Completion" shall be issued. If, in the opinion of the EPA Project Representative, the site area cannot be fully utilized for purposes for which it was intended, no "Certificate of Substantial Completion" will be issued and another walkthrough will be scheduled. All punch list items identified by the walkdowns shall be repaired or replaced, as required, to the satisfaction of the EPA Project Representative. Final payment will not be made until all of the punch list items are resolved to the satisfaction of the EPA Project Representative.

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section describes requirements for clearing, grubbing, stripping, and tree and debris removal.

1.2 DEFINITIONS

A. Interfering or Objectionable Material: Trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead, or decaying; topsoil.

B. Clearing: Removal of interfering or objectionable material lying on or protruding above ground surface.

C. Grubbing: Removal of vegetation and other organic matter including stumps, buried logs, and roots greater than 2 inches caliper to a depth of 6 inches below subgrade.

D. Stripping: Removal of topsoil and other organic matter.

E. Project Limits: Areas, as shown or specified, within which Work is to be performed.

1.3 SCHEDULING AND SEQUENCING

A. Prepare site only after adequate erosion and sediment controls are in place. Minimize areas exposed uncontrolled to erosion during installation of temporary erosion and sediment controls.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. Clear, grub, and strip areas actually needed for soil/sediment excavation, borrow, or site improvements within limits shown or specified.

B. Do not injure or deface vegetation that does not require removal.

3.2 CLEARING

A. Fell trees so that they fall away from facilities and vegetation not designated for removal.

B. Cut stumps not designated for grubbing flush with ground surface.

C. Cut off shrubs, brush, weeds, and grasses to within 2 inches of ground surface.

3.3 GRUBBING

A. Grub all areas where excavations, fill, roadways, structures, and utilities are to be placed.

3.4 STRIPPING

A. Strip areas to remove organic materials. Do not remove subsoil with topsoil.

B. Stockpile strippings, meeting requirements of Section 02233, SEEDING AND REVEGETATION, for topsoil, separately from other excavated material.

3.5 TREE REMOVAL OUTSIDE CLEARING LIMITS

A. Remove Within Project Limits: Dead, dying, leaning, or otherwise unsound trees that may strike and damage Project facilities in falling.

B. Cut stumps off flush with ground, remove debris, and if disturbed, restore surrounding area to its original condition.

3.6 DISPOSAL

A. Clearing and Grubbing Debris:

1. Dispose of debris at an appropriate landfill facility.

B. Strippings:

1. Dispose of strippings that are unsuitable for topsoil or that exceed quantity required for topsoil as directed by EPA Project Representative.
2. Stockpile topsoil in sufficient quantity to meet Project needs. Dispose of excess strippings as specified for clearing and grubbing.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

This section includes requirements for excavation, placement of backfill, finishing grading, proper survey control, continuous storm and groundwater management, and related items associated with the removal of contaminated soil and sediment required to remediate the specified areas on the Reasor Chemical Company Site, as directed by the EPA Project Representative and in accordance with the Contract Documents.

1.2 FIELD REQUIREMENTS

Placement and compaction of backfill materials and performance of associated earthworks will be subject to continuous inspection by the EPA Project Representative.

As the approved backfill materials are placed and compacted the EPA Project Representative shall continuously monitor the lift thickness and compacted condition of said materials to verify compliance with the requirements specified herein. Field density testing will not be required; however, a minimum of 3 passes with a smooth drum vibratory compactor shall be performed on each lift to obtain a stable backfill. Upon completion of the fill in thin lifts, the areas (particularly the ponds) will be proof-rolled with the loaded tandem axle dump truck or other equipment of similar weight. The proof-rolling shall be witnessed by the EPA Project Representative. All soft areas identified during proof-rolling shall be removed and backfilled with suitable fill material and recompacted.

PART 2 MATERIALS

2.1 BACKFILL MATERIAL

Common or foreign borrow backfill materials used for backfilling the soil and pond excavation areas shall meet the following requirements:

1. Material shall be environmentally clean and substantially free of refuse, debris, organic matter, frozen material, and miscellaneous or deleterious materials.
2. Material classified as CL, ML, CL-ML, SC, SM, or SW according to the Unified Soil Classification System (USCS).
3. Material shall not contain stones larger than 6 inches in the greatest dimension.

The EPA has identified a borrow area adjacent to the site. Preliminary testing and evaluation of the area has been conducted. Sufficient quantity and quality of material is available. The Contractor will be responsible for managing the borrow source to meet the needs of the project.

PART 3 EXECUTION

3.1 EXCAVATION

A. General

Excavation shall be carried out to the depths indicated on the Drawings or as otherwise indicated by the EPA Project Representative. The Contractor shall utilize equipment necessary to excavate existing materials for the duration of construction.

B. Unauthorized Excavation

Where unauthorized excavations are made below elevations or outside limits indicated on the Drawings or specified by the EPA Project Representative, the Contractor shall restore the excavation(s) to proper elevations with approved fill materials placed and compacted using controlled thin-lift construction techniques as specified herein, and as directed by the EPA Project Representative, at no cost to the EPA.

C. Sheeting, Shoring, and Bracing

Method, design, and adequacy of any required sheeting, shoring, and bracing shall meet the requirements of 29 CFR PART 1926 and are the responsibility of the Contractor. All damage related to or caused by the excavation shall be repaired at the expense of the Contractor. The design and method of the sheeting, shoring, and bracing shall provide means for its removal as backfill progresses.

Provide sheeting and shoring as required to ensure safe working conditions, maintain required excavation dimensions for proper construction, and to prevent accidents, cave-ins, and damage to adjacent structures, facilities, and surfaces. Sheeting, shoring, and bracing shall be placed so as not to interfere with the construction work.

Remove sheeting, shoring, bracing, and all wood forms, concurrently with backfilling operations. Such removal shall be accomplished in a manner that precludes settlement of the backfill, cave-in of the excavation sides, and prevents damage to adjacent surfaces. Voids left or caused by the removal shall be promptly filled.

A minimum of three (3) passes of the smooth drum vibratory compactor shall be completed over the entire area prepared for structural fill placement. Following

completion of this activity, the entire area will be visually inspected and hand-probed by the EPA Project Representative. Should any loose or otherwise unstable surficial materials be detected by the visual inspection/hand-probing activities, these areas shall be recompacted using the roller or appropriate compaction equipment with as many passes as are necessary to densify these materials to the satisfaction of the EPA Project Representative. If these materials cannot be densified sufficiently by the additional proof-rolling, they shall be undercut until stable materials are encountered. The resulting undercut subgrade shall then be proof-rolled on-grade until sufficiently stable, as determined by the EPA Project Representative. (If the undercut zones are of minimal areal extent, hand-operated compaction equipment may be necessary to densify these areas.)

D. Finish Grading

Perform grading operations so that the excavation will be well-drained at all times. Maintain drainage ditches and keep them open and free from soil, debris, and leaves until final acceptance of the work. Finish all grading on neat, regular lines conforming to the general grades of the surrounding area.

Grade all areas disturbed during the work of the Contract. Final grading will match surrounding grades, slightly mounded to prevent ponding of surface water as a result of settlement.

E. Dewatering and Drainage

The Contractor shall not excavate soil below the groundwater table. It shall be the responsibility of the Contractor for monitoring each excavation as work progressed to determine if water is being encountered. The presence or absence of water shall not entitle the Contractor to additional compensation. If water is encountered in excavations, the Contractor shall cease excavation and notify the EPA or EPA Project Representative.

END OF SECTION

SECTION 02220

EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes requirements excavation and staging of contaminated soil and sediments as well as handling of contaminated surface water. Surface soil, ponded surface water, and sediments from the pond are all part of the remedial action requiring removal. Three areas have been identified for surface soil removal and four ponds are scheduled for both surface water and sediment removal. The Contractor shall excavate all soil and sediments and transport to a central staging area for sampling and final disposal. The ultimate goal will be to plan the proper procedures that will prevent spreading of contamination over the site.

B. The work shall consist of excavation of approximately 345 cubic yards of contaminated soil and 1076 cubic yards of contaminated sediment from the areas shown on Sheet 3 of the Construction Plans. The sediment will be excavated from four on-site ponds that will require the removal of approximately 344,000 gallons of contaminated surface water prior to sediment excavation. WESTON and EPA have conducted site characterization to determine the estimated volumes of soil; however, upon excavation to the proposed depths, the Contractor will conduct confirmation sampling to determine if the soil cleanup levels have been achieved.

1.2 MATERIAL TESTING

A. The Contractor shall arrange for an inspection of the proposed backfill borrow source prior to the commencement of any backfill operations. During said inspection, the Contractor shall provide any equipment necessary to excavate test pits throughout the limits of the proposed source so as to provide the EPA with a thorough inspection of the type(s) and uniformity of material(s) throughout the proposed source.

1.3 BACKFILL MATERIALS

A. Backfill material will be required for all soil and sediment excavations. Backfill shall be classified in accordance with ASTM D 2487 and shall be free from roots. Common or foreign borrow backfill and materials used for earthworks construction shall meet the following requirements:

1. Material shall be environmentally clean and free of refuse, debris, organic matter, frozen material, and miscellaneous or deleterious materials.

2. Material classified as CL, ML, CL-ML, SC, SM, or SW according to the Unified Soil Classification System (USCS).

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXCAVATION

A. The approximate areas to be excavated are shown on the Construction Plans. The Contractor shall excavate all contaminated soil and sediments from within the areas shown on the Plans. Confirmation samples will be collected to determine if additional excavation is required. Excavation shall be performed in a manner that will limit the potential for contaminated material to be mixed with uncontaminated material. Excavation will not extend outside the limits shown the Plans without prior approval from EPA.

3.2 DEWATERING

A. Surface water impounded by the four on-site ponds will be removed for offsite disposal. It is anticipated that the water will be directly pumped from the ponds into transport tanker trucks for disposal. Temporary containment pads will be employed during tanker filling operations to contain any spilled water. Dewatering will be necessary to provide access to the sediments within the ponds also scheduled for excavation as shown the plans. Clean surface water will be diverted from entering the excavation and coming in contact with contaminated sediments. Contaminated sediments may require dewatering to meet disposal criteria and for transport to the disposal facility. The Contractor will stage the contaminated sediments on the constructed staging pad to allow the material to freely drain to a sump. Liquids collected in the staging area sump will be considered contaminated and must be pumped to temporary storage tanks. This water will ultimately be pumped to tanker transport trucks for off-site disposal.

B. The Contractor shall plan excavation activities such that no excavations are open for a period longer than three days. This should be sufficient time for analytical results of confirmation sampling to be completed. In the event of rain prior to backfilling, any collected rainwater must be sampled to determine if it has become contaminated with any of the contaminants remaining in the excavation. Water contaminated with constituents above the remediation goal must be disposed in accordance with contaminated surface water as described in this section.

3.3 CONFIRMATION SAMPLING AND ANALYSIS

A. EPA or its authorized representative will be present to inspect the excavation and removal activities. After all material suspected of being contaminated has been

removed, the excavation will be examined for evidence of further contamination. Excavation of additional material will be as directed by the EPA. Confirmation samples will be collected by the Contractor and analyzed for the following: volatile organics, semi-volatile organics, and inorganic constituents. The EPA Project Representative will be responsible for evaluating the analytical results for comparison to the remediation goals.

Soil samples shall be collected from the bottom of all excavations on an approximate 25-foot grid and from the sidewalls at a frequency of one per every 25 feet. Soil samples shall not be collected from beneath the water table. Laboratory turnaround time shall be no longer than 48 hours for confirmation samples.

3.4 CONTAMINATED SOIL/SEDIMENT MATERIAL STORAGE

A. Stockpiles

One staging area shall be constructed to isolate stored contaminated soils and sediments from the environment and shall be located as shown in the Construction Drawings to minimize the spread of contamination to clean areas. Both soil and sediments will be stockpiled together. The stockpiles shall be constructed to include:

1. A synthetic geomembrane cover to prevent precipitation from entering the stockpile. Non-reinforced geomembrane covers shall have minimum thickness of 10 mils. The cover shall be sufficiently anchored.
2. The entire base area shall be lined with a geomembrane to prevent leaching of contaminants into the clean soil and groundwater. The bottom geomembrane shall have a minimum thickness of 40 mils and must be integrated into a soil berm completely surrounding the stockpile to capture freely drained liquids. Liquids will drain to a corner sump to be pumped out for disposal as shown on the drawings.

3.5 SAMPLING OF CONTAMINATED MATERIALS

A. Contaminated materials shall be sampled at the frequency required for off-site disposal. Samples shall be tested for the constituents required by the disposal facility. EPA has preliminary Toxicity Characteristic Leachate Procedure (TCLP) data on composite samples of the soil, sediment, and surface water. Based on the data, the soil and sediment does not leach any constituents above the regulatory levels (40 CFR 261.24).

Additional sampling and analyses to the extent required by the approved off-site disposal facility shall be the responsibility of the Contractor and shall be performed at no additional cost to EPA.

3.6 FINISH GRADING

A. Perform grading operations so that the excavation will be well drained at all times. Maintain drainage ditches and keep them open and free from soil, debris, and leaves until final acceptance of the work. Finish all grading on neat, regular lines conforming to the sections, lines, grades, and contours shown on the Drawings or if not shown, in accordance with the criteria set forth herein. Perform the grading work in proper sequence with all other associated operations.

END OF SECTION

SECTION 02230

WASTE TRANSPORTATION AND DISPOSAL

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes requirements for transportation and disposal of wastes generated from the remedial actions including contaminated surface water, soil, and sediments. The Contractor shall furnish all labor, materials, tolls, equipment, and analytical testing required to transport contaminated material from the site to permitted disposal facilities for landfilling or treatment.

1.2 REGULATORY REQUIREMENTS

A. The Contractor is responsible for maintaining the proper manifesting procedures for transportation to the disposal facility in accordance with DOT requirements. In addition, the Contractor is responsible for collecting an analyzing all materials for disposal characterization as required by the state requirements and the disposal facility.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 POND LIQUIDS

A. Liquids from the ponds will be pumped directly into tanker transport trucks for disposal. One containment pad will be constructed to fully contain the trailer section of the tank truck. This pad will be constructed of 40-mil thick plastic liner with sand bag berms or prefabricated containment berms as manufactured by Interstate Products, Inc., or approved equal. Adjacent to the containment the Contractor will construct a loading station as shown on the Drawings. This loading station will permit water to be pumped directly into the top fill port of the tanker.

3.2 SOIL AND POND SEDIMENTS

A. Soil and pond sediments stored on the staging pad will be allowed to freely drain into a constructed sump as shown on the drawings. Staged pond sediments and soil will be loaded into dump trucks for transportation and disposal. The Contractor will be responsible for providing licensed haulers to transport the soil/sediment to the landfill for disposal. The New Hanover County landfill is the nearest Subtitle D Landfill that can accept the material.

END OF SECTION

SECTION 02231

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Work includes furnishing all labor, equipment, and materials needed to construct temporary erosion and sediment control features and maintain proper drainage throughout the site area while remedial activities are ongoing. The Contractor will perform all necessary perimeter erosion and sediment control activities including grassing and maintenance of silt fence and the main access road.

B. The Contractor shall prepare an Erosion and Sediment Control Plan in accordance with the North Carolina Erosion and Sedimentation Control Planning and Design manual as well as all relevant local, state, and federal rules and regulations regarding sediment and erosion control. The Erosion and Sediment Control Plan shall be submitted to NC DENR, Division of Land Quality, Wilmington Regional Office.

PART 2 PRODUCTS

2.1 SILT FENCE

A. The Contractor shall supply silt fence to control surface sediment control. Acceptable types of silt fence include ProPex® 2130, Mirifi® Silt Fence, or approved equal.

PART 3 EXECUTION

3.1 SILT FENCE

A. Silt fence will be placed in accordance with the plans and drawings. In general, areas to be excavated, including the ponds, will be completely bordered by a silt fence to prevent off-site migration of contaminated soil.

3.2 CHECK DAMS

A. Check Dams may be placed in existing drainage ditches if they are expected to receive large volumes of stormwater runoff. If installed, they must later be removed upon completion of remedial construction activities. The contractor must take extreme care during placement and removal to avoid excess disturbance of these jurisdictorial wetlands.

END OF SECTION

SECTION 02233

SEEDINGAND REVEGETATION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Work presented under this section includes furnishing all equipment, tools, materials, and labor necessary for establishing permanent vegetative cover over the disturbed areas. To the extent possible, vegetation shall include replacement of natural vegetation with native plants.

PART 2 PRODUCTS

2.1 MATERIALS

A. Lime:

1. Composition: Ground limestone with not less than 85 percent total carbonates.
2. Gradation:
   a. Minimum 50 percent passing No. 40 sieve; and
   b. Minimum 85 percent passing No. 10 sieve.

B. Fertilizer:

1. Fertilization for dry application shall be standard commercial fertilizer with guarantee of analysis conforming to a 10-10-10 formula. Fertilizer shall be uniform in composition, free flowing, and suitable for application with approved equipment.
2. Fertilizer shall have the following minimum percentage of plant food by weight:
   a. Hydroseed Mix:
      1) Nitrogen: 10 percent.
      2) Phosphoric Acid: 10 percent.
      3) Potash: 10 percent.

C. Seed Mixture, Permanent and Temporary: In accordance with requirements to North Carolina Department of Agriculture.

D. Mulching Material:

1. Mulching materials specified under this subparagraph shall be utilized with temporary seeding.

2. Straw Mulch: Dry oat or wheat straw, free from weeds and foreign matter detrimental to plant life.
3. Fiber Mulch/Wood Cellulose Fiber Mulch: Mulch for hydroseeding shall be a specially processed 100% virgin wood fiber mulch containing no growth or germination-inhibiting factors. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a homogeneous slurry. The mulch shall be dyed a suitable color to facilitate inspection of material placement and when sprayed on the ground, the material shall allow absorption and percolation of moisture.

E. Top Soil: Top soil shall be obtained from the borrow source area identified on the Construction Drawings. The Contractor must monitor placement to ensure that it is reasonably free of clay, lumps, stones, stumps, roots and similar objects, any of which are larger than 2 inches in diameter, brush, objectionable weeds or other litter, excess acid or alkali, or any other material or substance which may be harmful to plant growth or a hindrance to grading and maintenance operations.

2.2 EQUIPMENT

A. Choice of equipment to perform required operations in conformance with these specifications shall be the responsibility of the Contractor. However, any equipment that results in waste or damage of material, or inaccurate work, or is otherwise objectionable is to be promptly replaced.

PART 3 EXECUTION

3.1 PREPARATION

A. Contractor shall verify that the soil base is ready to receive work of this section and that final topsoil dressing is within reasonably close conformity to the required lines, grades, and cross-sections.

3.2 EROSION CONTROL

A. Unless designated otherwise on the Construction Drawings, all areas made bare during the construction activities and not covered with gravel or riprap as to be used for specific constructed features shall receive an application of fertilizer, lime, and seed.

3.3 SEEDING

A. Do not sow immediately following rain, when ground is too dry, or during windy periods.

B. Permanent seeding shall be done within 5 days following final grading unless conditions preclude satisfactory completion of work. Seeding operations may be performed hydraulically or by dry broadcasting.

C. Temporary seeding shall be performed within 5 days where grading has not been completed and has temporarily ceased, and grading activities are not anticipated to resume within 15 days.

D. Dry Seeding:

1. Apply seed at a rate of 130 pounds per acre evenly in two intersecting directions.
2. Apply water with a fine spray immediately after each area has been mulched or received erosion control blankets. Saturate to 2 in. depth of soil.

E. Hydraulic Application:

1. Combined hydraulic application of seed, fertilizer, mulch and tackifier will be considered if site conditions are suitable (i.e., weather will be dry sufficiently long to let the mixture stabilize. All temporary seeding areas shall be tackified with a tackifier at the manufacturer's recommended rate.
2. Hydraulic spraying equipment and mixture shall be designed that when the mixture is sprayed over the area, the mixture components shall be equal in quantity to the specified rates.
3. Prepare 1-inch depth seed bed; obtain Construction Manager acceptance prior to proceeding.
4. Apply by hydroseeding method on moist soil, but only after free surface water has drained away. Prevent drift and displacement of mixture into other areas.

F. Seed Protection:

1. Immediately following temporary seeding apply straw mulch at a rate of 100 lb/1,000 ft^2, or apply wood fiber mulch hydraulically at the rate of 28 lb. to 35 lb/1,000 ft^2.

3.4 MULCHING

A. Apply uniformly on disturbed areas that will remain undisturbed for 14 days or more, as requested by Construction Manager, and on seeded areas. Do not apply mulch on seeded areas that will be immediately covered with erosion control matting.

B. Application: Sufficiently loose to permit penetration of sunlight and air circulation, and sufficiently dense to shade ground, reduce evaporation rate, and prevent or materially reduce erosion of underlying soil.

1. Straw: Apply by hand or mechanical means to minimum depth of 2 inches.
2. Wood Cellulose Fiber: As recommended by manufacturer.

3.5 PROTECTION OF INSTALLED WORK

A. Protect grassed areas against damage for duration of project.

B. Any areas damaged by construction or operation activities shall be promptly repaired by taking the necessary steps to restore the vegetation.

C. Inspect, repair, and replace as necessary all erosion control measures during the time period from start of construction to closure of project.

D. The contractor shall provide a one-year warranty on the re-establishment of vegetation of all impacted areas of the site.

END OF SECTION

REMEDIAL ACTION COST ESTIMATE
REASOR CHEMICAL COMPANY SITE
WORK ASSIGNMENT 147-RDRD-A424

Notes:

1. This remedial action construction cost estimate has been updated to reflect changes during the intermediate design phase. The current total construction cost estimate is $358,400.
2. This cost estimate includes only those costs for remedial action construction. No costs for EPA oversight monitoring have been included.
3. This estimate includes typical overhead rates, fringe benefits, and fees, etc. for the remedial construction industry.
4. The estimate has been prepared using G2 Estimator™. Presented is a summary report followed by worksheets for each work activity required for the project scope of work.

REASOR CHEMICAL COMPANY SITE
FINAL DESIGN - REMEDIAL ACTION COST ESTIMATE

Summary Report

Item	Description	Item Information Quantity	Unit	Unit Price	Amount
0101	SITE VISIT & DOCUMENTATION REVIEW	1.00	LS	1,093.68	1,093.68
0210	REMEDIAL ACTION WORK PLAN	1.00	LS	3,133.51	3,133.51
0220	SITE SAFETY AND HEALTH PLAN	1.00	LS	1,777.74	1,777.74
0230	EROSION AND SEDIMENT CONTROL PLAN	1 00	LS	2,031.28	2,031.28
0320	CONTRACTOR MOBILIZATION/DEMOBILIZATION	1.00	LS	6,583.59	6,583.59
0420	SITE PREPARATION AND SET-UP	1.00	LS	29,635.40	29,635.40
0510	SOIL REMOVAL AREA - SOILS EXCAVATION	345.00	CY	18.84	6,498.90
0511	SOILS REMOVAL AREA - VERIFICATION SAMPLING	1.00	LS	9,893.28	9,893.28
0512	SOILS REMOVAL AREA - DISPOSAL PROFILE SAMPLIN	1.00	LS	1,890.72	1,890.72
0513	ON-SITE BORROW AREA PREPARATION	1.00	LS	4,393.41	4,393.41
0514	SOILS REMOVAL AREA - BACKFILLING/REGRADING	345.00	CY	8.46	2,919.13
0520	POND LIQUID REMOVALS - LIQUID PUMPING	344,000.00	GAL	0.03	9,498.52
0521	POND LIQUID REMOVALS - DISPOSAL SAMPLING	1.00	LS	1,890.72	1,890.72
0522	POND LIQUID REMOVALS - TRANSPORTATION/DISPOSA	344,000.00	GAL	0.24	82,560.00
0530	POND SEDIMENTS REMOVALS -	1,076.00	CY	11.39	12,255.64
0531	POND SEDIMENTS - LOAD FROM STOCKPILE TO TRUCK	1,076.00	CY	5.12	5,504.44
0532	POND SEDIMENTS - VERIFICATION SAMPLING	1.00	LS	12,393.28	12,393.28
0533	POND SEDIMENTS - DISPOSAL PROFILE SAMPLING	1.00	LS	1,890.72	1,890.72
0534	POND SEDIMENTS - TRANSPORTATION/DISPOSAL	1,915.00	TONS	24.12	46,189.80
0535	LOAD & HAUL BACKFILL FROM ON-SITE BORROW AREA	1.00	LS	15,143.64	15,143.64
0536	POND AREA - BACKFILLING/REGRADING	4,000.00	CY	3.79	15,147.84
0537	SITE RESTORATION AND SEEDING	2 00	ACRE	1,607.85	3,215.70
0910	SITE MANAGEMENT	1.00	LS	45,861.48	45,861.48
1000	PROJECT ADMIN/SUPPORT - HOME OFFICE	1.00	LS	30,683.92	30,683.92
1100	PROJECT REPORTING - DRAFT & FINAL	1.00	LS	6,322.16	6,322.16
Report Total					358,408.50

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0101 - Site Visit & Document Review

Worksheet Header: Quantity: 1 00 Unit:LS Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes

01 00 HTRW/WBS	0101	SITE VISIT & DOCUMENTATION REVIEW
02 00 PRICING BREAKDOW	0100	PRE-CONSTRUCTION/WORK PLANS

Formula Variables

Global Variables

Notes

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 10000190	Site Manager	8 00	HR	8 00 1 00	598 48 74 81										598 48 74 81
2 00 01000423	QC/Safety Officer	8 00	HR	8 00 1 00	495 20 61 90										495 20 61 90
	Sheet Totals	1 00	LS	16 00	1 093 68										1 093 68

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0210 - Remedial Action Work Plan

Worksheet Header: **Quantity:** 1.00 **Unit:** LS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01 00 HTRW/WBS	0210	REMEDIAL ACTION WORK PLAN
02 00 PRICING BREAKDOW	0100	PRE-CONSTRUCTION/WORK PLANS

Formula Variables

Global Variables

Notes

Work plans to include Draft & Final - 6 copies ea

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 01000390	Project Manager	8 00	HR	8 00 1 00	743 52 92 94										743 52 92 94
2 00 01000190	Health and Safety Officer/QC	2 00	HR	2 00 1 00	123 80 61 90										123 80 61 90
3 00 01000120	Clerical	16 00	HR	16 00 1 00	661 44 41 34										661 44 41 34
4 00 10000190	Site Manager	8 00	HR	8 00 1 00	598 48 74 81										598 48 74 81
5 00 01000040	CADD Draftsman	4 00	HR	4 00 1 00	195 52 48 88										195 52 48 88
6 00 4010CAD1	CADD Usage	4 00	HR						52 00 13 00						52 00 13 00
7 00 01000110	Scheduler, Cost/Construction	3 00	HR	3 00 1 00	166 80 55 60										166 80 55 60
8 00 4010COP1	Copies - Per Copy	800 00	EA						56 00 0 07						56 00 0 07
9 00 3000REPR	Document Production	75	LS							535 95 714 60					535 95 714 60
	Sheet Totals	1 00	LS	41 00	2,489 56				108 00	535 95					3,133 51

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0220 - Site Safety and Health Plan

Worksheet Header: Quantity: 1.00 Unit:LS Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes		
01.00 HTRW/WBS	0220	SITE SAFETY AND HEALTH PLAN
02.00 PRICING BREAKDOW	0100	PRE-CONSTRUCTION/WORK PLANS

Formula Variables
Global Variables

Notes

Plan to address all known hazards, physical and chemical, that are likely to be encountered during execution of this project. The HSP will be reviewed and approved by the USEPA prior to the Contractor mobilizing to the site.

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1.00 4010COP1	Copies - Per Copy	600.00	EA						42.00 0.07						42.00 0.07
2.00 01000260	Cert Ind Hygienist	2.00	HR	2.00 1.00	246.94 123.47										246.94 123.47
3.00 01000414	Project Engineer	8.00	HR	8.00 1.00	500.48 62.56										500.48 62.56
4.00 01000390	Project Manager	4.00	HR	4.00 1.00	371.76 92.94										371.76 92.94
5.00 01000120	Clerical	8.00	HR	8.00 1.00	330.72 41.34										330.72 41.34
6.00 3000REPR	Document Production	.40	LS							285.84 714.60					285.84 714.60
	Sheet Totals	1.00	LS	22.00	1,449.90				42.00	285.84					1,777.74

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0230 - Erosion and Sediment Control Plan

Worksheet Header: **Quantity:** 1 00 **Unit:** LS **Estimator:** LER **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01 00 HTRW/WBS	0230	EROSION and SEDIMENT CONTROL PLAN
02 00 PRICING BREAKDOW	0100	PRE-CONSTRUCTION/WORK PLANS

Formula Variables

Global Variables

Notes

Prepare a site specific Erosion and Sediment Control Plan The Erosion and Sediment Control Plan will be reviewed and approved by the USEPA prior to the Contractor mobilizing to the site

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	End/User	(Not Used)	(Not Used)	Total Cost
1 00 4010COP1	Copies - Per Copy	600 00	EA						42 00 0 07						42 00 0 07
2 00 01000414	Project Engineer	16 00	HR	16 00 1 00	1 000 96 62 56										1 000 96 62 56
3 00 01000390	Project Manager	4 00	HR	4 00 1 00	371 76 92 94										371 76 92 94
4 00 01000120	Clerical	8 00	HR	8 00 1 00	330 72 41 34										330 72 41 34
5 00 3000REPR	Document Production	40	LS							285 84 714 60					285 84 714 60
	Sheet Totals	1 00	LS	28 00	1 703 44				42 00	285 84					2 031 28

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0320 - Contractor Mobilization/Demobilization

Worksheet Header: **Quantity:** 1.00 **Unit:** LS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01.00 HTRW/WBS	0320	CONTRACTOR MOBILIZATION/DEMOBILIZATION
02.00 PRICING BREAKDOW	0300	CONTRACTOR MOB AND DEMOB

Formula Variables

Global Variables

Notes

Mobilize manpower and equipment to the site.

Mobilize three (3) equipment operators.
two (2) laborers; two (2) Sampling Techs; and Site Manager to the site.

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1.00 1250LAB1	Group I Laborer	16.00	HR	16.00 1.00	327.52 20.47										327.52 20.47
2.00 12500160	Power Equip Oper - Heavy	16.00	HR	16.00 1.00	472.32 29.52										472.32 29.52
3.00 10000190	Site Manager	8.00	HR	8.00 1.00	598.48 74.81										598.48 74.81
4.00 01000424	Sample Technicians	16.00	HR	16.00 1.00	893.28 55.83										893.28 55.83
5.00 1250TRKH	Truck Driver - Heavy	16.00	HR	16.00 1.00	619.84 38.74										619.84 38.74
6.00 3000CHB3	Mob/Demob Excavator	2.00	EA					571.68 285.84							571.68 285.84
7.00 3000CHB8	Mob/Demob Tri-axle Dump Truck	4.00	EA					648.00 162.00							648.00 162.00
8.00 3000CHB4	Mob/Demob Wheel Loader	2.00	EA					571.68 285.84							571.68 285.84
9.00 3000CHB6	Mob/Demob D5 Dozer	2.00	EA					571.68 285.84							571.68 285.84
10.00 3000DPTK	Mobilization Compactor	2.00	EA					83.38 41.69							83.38 41.69
11.00 3000FTM2	Mob. Field Office - 10' x 44' - WillaimsScottsman	1.00	LS					363.25							363.25
								363.25							363.25

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Line	Resource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
12 00	3000SBWT	Mob/Demob Water Truck	2 00	EA							297 76					297 76
											148 88					148 88
13 00	3000FTD2	Demob Field Office -10'x44' WilliamsScottsman	1 00	LS					362 25							362 25
									362 25							362 25
14 00	3000FTD4	Field Office Trailer Knockdown - WilliamsScottsman	1 00	LS					202 47							202 47
									202 47							202 47
		Sheet Totals	1 00	LS	72 00	2 911 44			3,374 39		297 76					6,583 59

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0420 - Site Preparation and Site Set-Up

Worksheet Header: **Quantity:** 1.00 **Unit:** LS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01 00 HTRW/WBS	0420	SITE PREPARATION AND SET-UP
02 00 PRICING BREAKDOW	0400	SITE PREPARATION & SITE SET-UP

Formula Variables

Global Vanables

Notes

Set up trailers and equipment Construct two (2) staging areas.
Soil/Sediment Area - Assume 100'-0 x 100'-0 area with geotextile and 40 mil synthetic liner with earthen berms Provide sump and pump for natural dewatering of pond sediments

Spill Containment - Assume 12'-0 x 40'-0 area for tanker loading Install geo-textile and synthetic liner with earthen berms

E&S Controls - Soil/Sediment Stockpile area - 100'-0 x 100'-0.

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 5100SLT1	Silt Fence 3' X 100' w/stakes -	20 00	RL							825 60 41 29					825 60 41 29
2 00 1250LAB1	Group I Laborer	32 00	HR	32 00 1 00	655 04 20 47										655 04 20 47
3 00 12500161	Power Equipment Operator - Medium	30 00	HR	30 00 1 00	873 90 29.13										873 90 29 13
4 00 25000004	Backhoe	3 00	DY				564 51 188 17								564 51 188 17
5 00 51000002	Stakes	2 00	LS							119 10 59 55					119 10 59 55
6 00 51000006	Hay Bales	500 00	LF							1,785 00 3 57					1 785 00 3 57
7 00 5100FEN1	Safety Fence - orange 4' X 100' - MMC	8 00	RL							628 48 78 56					628 48 78 56
8 00 5100FEN2	Fence Post	678 00	EA							4,040 88 5 96					4,040 88 5 96
9 00 30000028	Subcontractor- Utility Hook-up	1 00	LS					1,786 50 1,786 50							1,786 50 1,786 50
10 00 3000BWS1	Potable Water - Bottled Water Service - Initial set up	1 00	LS					595 50							595 50

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Line	Resource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
									595 50							595 50
11 00	3000FTM4	Field Office Trailer Block & Level - WilliamsScottsman	1 00	LS					38 94							38 94
									38 94							38 94
12 00	3000FTM6	Setup/Anchor Trailer WilliamsScottsman	1 00	LS					190 56							190 56
									190 56							190 56
13 00	30000017	Subcontract 40 mil LLDPE Smooth	10 480 00	SF					4 506 40 0 43							4 506 40 0 43
14 00	30000022	Subcontract- Geotextile	10 480 00	SF					5 030 40 0 48							5 030 40 0 48
15 00	12500160	Power Equip Oper - Heavy	90 00	HR	90 00 1 00	2 656 80 29 52										2 656 80 29 52
16 00	1250LAB1	Group I Laborer	60 00	HR	60 00 1 00	1 228 20 20 47										1 228 20 20 47
17 00	2500C416	Caterpillar 416 Backhoe/Loader	3 00	DY				964 71 321 57								964 71 321 57
18 00	2500DOZR	John Deere - JD 550 Dozer	3 00	DY				821 73 273 91								821 73 273 91
19 00	2500CMP3	Compactor	3 00	DY				535 95 178 65								535 95 178 65
20 00	5100STON	Crushed Stone	100 00	TN							1 787 00 17 87					1 787 00 17 87
		Sheet Totals	1 00	LS	212 00	5 413 94		2 886 90	12 148 30		9 186 26					29,635 40

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0510 - Soil Removal Area - Soils Excavation

Worksheet Header: Quantity: 345 00 Unit:CY Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes

01 00 HTRW/WBS	0510	SOIL REMOVAL AREA - SOILS EXCAVATION
02 00 PRICING BREAKDOW	0500	SOILS REMOVAL AREA WORK

Formula Variables

Global Variables

Notes

Excavate soils from Removal Area Set-up 20'-0 x 20'-0 grid for sampling.
Assumes 1'-0 to 2'-0 deep excavations assume area of 100'-0 x 100'-0

Load trucks directly and haul to staging area
Assume 2 days with delays in sampling
Use one (1) Excavator, one (1) Wheel Loader, and one (1) Dump truck

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 12500160	Power Equip Oper - Heavy	20 00	HR	20 00 1 00	590 40 29 52										590 40 29 52
2 00 12500162	Power Equipment Operator - Light	20 00	HR	20 00 1 00	526 40 26 32										526 40 26 32
3 00 1250LAB1	Group I Laborer	60 00	HR	60 00 1 00	1 226 20 20 47										1 226 20 20 47
4 00 1250TRKH	Truck Driver - Heavy	20 00	HR	20 00 1 00	774 80 38 74										774 80 38 74
5 00 2500CBH2	Caterpillar 330 Tracked Excavator, or Equivalent	2 00	DY				628 92 314 46								628 92 314 46
6 00 2500C416	Caterpillar 416 Backhoe/Loader	2 00	DY				643 14 321 57								643 14 321 57
7 00 2500TRAX	Tri-Axle Dump Truck	2 00	DY				750 34 375 17								750 34 375 17
8 00 51000002	Stakes	4 00	LS							238 20 59 55					238 20 59 55
9 00 51000003	Flagging	5 00	LS							89 35 17 87					89 35 17 87
10 00 51000004	Spray Paint	20 00	LS							238 20 11 91					238 20 11 91

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Line	Resource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
11 00	5100PLY6	6-mil Ploy Sheeting 24'X100' Roll	5 00	RL							408 95 81 79					408 95 81 79
12 00	50501010	FOGM - (fuel, oil, grease, maintenance)	200 00	GAL							382 00 1 91					382 00 1 91
		Sheet Totals	345 00	CY	120 00	3,119 80		2,022 40			1 356 70					6,498 90

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0511 - Soil Removal Area - Verification Sampling

Worksheet Header: Quantity: 1 00 Unit:LS Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes			Formula Variables
01 00 HTRW/WBS	0511	SOILS REMOVAL AREA - VERIFICATION SAMPLING	Global Vanables
02 00 PRICING BREAKDOW	0500	SOILS REMOVAL AREA WORK	

Notes

Take eighteen (18) samples Quick turn-around with the samples.
Lab testing at $500 00 per sample

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T&D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 01000424	Sample Technicians	16 00	HR	16 00 1 00	893 28 55 83										893 28 55 83
2 00 3000LABD	TCLP Metals (23) - Soil	18 00	EA					9,000 00 500 00							9,000 00 500 00
	Sheet Totals	1 00	LS	16 00	893 28			9 000 00							9 893 28

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0512 - Soil Removal Area - Disposal Profile Sampling

Worksheet Header: **Quantity:** 1.00 **Unit:** LS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes			Formula Variables
01 00 HTRW/WBS	0512	SOILS REMOVAL AREA - DISPOSAL PROFILE SAMPLIN	Global Variables
02 00 PRICING BREAKDOW	0500	SOILS REMOVAL AREA WORK	

Notes

Take two (2) Disposal Profile Samples.
Lab tests at $700.00 per test for quick turn-around.

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 01000424	Sample Technicians	4 00	HR	4 00 1 00	223 32 55 83										223 32 55 83
2 00 3000LABG	Profile Samples	2 00	EA					1,667 40 833 70							1,667 40 833 70
	Sheet Totals	1 00	LS	4 00	223 32			1 667 40							1,890 72

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0513 - On-Site Borrow Area Preparation

Worksheet Header: Quantity: 1 00 Unit: LS Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes			Formula Variables
01 00 HTRW/WBS	0513	ON-SITE BORROW AREA PREPARATION	Global Variables
02 00 PRICING BREAKDOW	0400	SITE PREPARATION & SITE SET-UP	

Notes

Clearing, grubbing, silt fences, etc for Borrow Area Backfill materials will be loaded from this site
Assume two (2) days of Borrow Area Preparation time

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 12500160	Power Equip Oper - Heavy	40 00	HR	40 00 1 00	1 180 80 29 52										1 180 80 29 52
2 00 1250LAB1	Group I Laborer	40 00	HR	40 00 1 00	818 80 20 47										818 80 20 47
3 00 2500C416	Caterpillar 416 Backhoe/Loader	2 00	DY				643 14 321 57								643 14 321 57
4 00 2500DOZR	John Deere - JD 550 Dozer	2 00	DY				547 82 273 91								547 82 273 91
5 00 50501010	FOGM - (fuel oil grease, maintenance)	160 00	GAL							305 60					305 60
										1 91					1 91
6 00 5100FEN1	Safety Fence - orange 4' X 100' - MMC	5 00	RL							392 80					392 80
										78 56					78 56
7 00 5100FEN2	Fence Post	50 00	EA							298 00 5 96					298 00 5 96
8 00 5100SLT1	Silt Fence 3' X 100' w/stakes - MMC	5 00	RL							206 45 41 29					206 45 41 29
	Sheet Totals	1 00	LS	80 00	1 999 60		1 190 98			1,202 85					4 393 41

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0514 - Soil Removal Area - Backfilling and Regrade

Worksheet Header: **Quantity:** 345.00 **Unit:** CY **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01.00 HTRW/WBS	0514	SOILS REMOVAL AREA - BACKFILLING/REGRADING
02.00 PRICING BREAKDOW	0500	SOILS REMOVAL AREA WORK

Formula Variables

Global Variables

Notes

Backfill areas with common fill materials, including 4" topsoil and hydroseeding of areas.

Common Fill Required - 170 CY.
Topsoil Required - 176 CY
Place in 8" lifts with compaction.

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1.00 12500161	Power Equipment Operator - Medium	16.00	HR	16.00 1.00	466.08 29.13										466.08 29.13
2.00 1250LAB1	Group I Laborer	16.00	HR	16.00 1.00	327.52 20.47										327.52 20.47
3.00 1250TRKH	Truck Driver - Heavy	8.00	HR	8.00 1.00	309.92 38.74										309.92 38.74
4.00 2500DOZR	John Deere - JD 550 Dozer	1.00	DY				273.91 273.91								273.91 273.91
5.00 2500VIBR	Vibratory Roller	1.00	DY				616.94 616.94								616.94 616.94
6.00 2500TRAX	Tri-Axle Dump Truck	1.00	DY				375.17 375.17								375.17 375.17
7.00 2500WTR1	Water Truck 2000 gl	1.00	DY				167.59 167.59								167.59 167.59
8.00 50501010	FOGM - (fuel, oil, grease, maintenance)	200.00	GAL							382.00 1.91					382.00 1.91
	Sheet Totals	345.00	CY	40.00	1,103.52		1,433.61			382.00					2,919.13

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0520 - Pond Liquid Removals - Liquid Pumping

Worksheet Header: **Quantity:** 344000.00 **Unit:** LS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01.00 HTRW/WBS	0520	POND LIQUID REMOVALS - LIQUID PUMPING
02.00 PRICING BREAKDOW	0520	POND SEDIMENTS REMOVALS

Formula Variables

Global Variables

Notes

Pump liquids from Pond Areas directly to Tank Trucks.

Two (2) Laborers and one (1) Godwin Pump - 350 gpm diesel driven pump.
Suction Hose - Assume 40'-0 long
Discharge Hose - Assume 50'-0 long.

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1.00 1250LAB1	Group I Laborer	112.00	HR	112.00 1.00	2,292.64 20.47										2,292.64 20.47
2.00 2500GODWIN1	Godwin - Diesel Driven Pump - @ 350 gpm	7.00	DY				3,251.43								3,251.43
							464.49								464.49
3.00 2500GODWIN2	Godwin - Sullair Compressor for prime assist	7.00	DY				666.96								666.96
							95.28								95.28
4.00 2500GODWIN3	Godwin - Suction Hose - 20"-0 Length	14.00	DY				416.78 29.77								416.78 29.77
5.00 2500GODWIN4	Godwin - Discharge Hoses - 50'-0 Long	7.00	DY				200.06								200.06
							28.58								28.58
6.00 2500GODWIN5	Godwin - Automatic Murphy Switch	7.00	DY				1,072.40 153.20								1,072.40 153.20
7.00 2500GODWIN6	Godwin - Delivery Charges	2.00	EA				595.50 297.75								595.50 297.75
8.00 50501010	FOGM - (fuel, oil, grease, maintenance)	525.00	GAL							1,002.75					1,002.75
										1.91					1.91

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Line	Resource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
		Sheet Totals	344,000 00	LS	112 00	2,292 64		6,203 13			1,002 75					9,498 52

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0521 - Pond Liquid Removals - Disposal Profile Sampl

Worksheet Header: **Quantity:** 1.00 **Unit:** LS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01 00 HTRW/WBS	0521	POND LIQUID REMOVALS - DISPOSAL SAMPLING
02 00 PRICING BREAKDOW	0520	POND SEDIMENTS REMOVALS

Formula Variables

Global Variables

Notes

Take two (2) samples for Profile Sampling

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 01000424	Sample Technicians	4 00	HR	4 00 1 00	223 32 55 83										223 32 55 83
2 00 3000LABG	Profile Samples	2 00	EA					1,667 40 833 70							1,667 40 833 70
	Sheet Totals	1 00	LS	4 00	223 32			1 667 40							1,890 72

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0522 - Pond Liquid Removals - Transportation & Dispo

Worksheet Header: **Quantity:** 344000 00 **Unit:** GALS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01 00 HTRW/WBS	0522	POND LIQUID REMOVALS - TRANSPORTATION/DISPOSA
02 00 PRICING BREAKDOW	0600	TRANSPORTATION AND DISPOSAL OF SOILS/WATER

Formula Variables
Global Vanables

Notes
Trasnportation and Disposal of Liquid Wastes
Subcontroactor $0 20 per gallon

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	End/Iner	(Not Used)	(Not Used)	Total Cost
1 00 7000DSP2	Transportation & Disposal of Liquids	344 000 00	GALS								82 560 00 0 24				82 560 00 0 24
	Sheet Totals	344,000 00	GALS	---							82,560 00	---			82 560 00

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0530 - Pond Sediment Removal - Excavation

Worksheet Header: **Quantity:** 1076 00 **Unit:** CY **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01 00 HTRW/WBS	0530	POND SEDIMENTS REMOVALS -
02 00 PRICING BREAKDOW	0520	POND SEDIMENTS REMOVALS

Formula Variables

Global Vanables

Notes

1 cy = 1 35 Tons
Remove sediments from Pond
Assume four (4) days
One (1) Trackhoe
One (1) Dozer
One (1) Dump Truck
Load directly to trucks and haul to stockpile

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 12500180	Power Equip Oper - Heavy	120 00	HR	120 00 1 00	3 542 40 29 52										3,542 40 29 52
2 00 1250LAB1	Group I Laborer	80 00	HR	80 00 1 00	1 637 60 20 47										1,637 60 20 47
3 00 1250TRKH	Truck Driver - Heavy	40 00	HR	40 00 1 00	1 549 60 38 74										1,549 60 38 74
4 00 2500CBH2	Caterpillar 330 Tracked Excavator, or Equivalent	4 00	DY				1,257 84 314 46								1,257 84 314 46
5 00 2500CDZ3	Caterpillar D4D Dozer	4 00	DY				857 52 214 38								857 52 214 38
6 00 2500TRAX	Tri-Axle Dump Truck	4 00	DY				1,500 68 375 17								1,500 68 375 17
7 00 50501010	FOGM - (fuel, oil, grease, maintenance)	1,000 00	GAL							1 910 00 1 91					1,910 00 1 91
	Sheet Totals	1,076 00	CY	240 00	6,729 60		3,616 04			1,910 00					12,255 64

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0531 - Soil and Pond Sediments - Load from Stockpile

Worksheet Header: **Quantity:** 1421 00 **Unit:** CY **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01 00 HTRW/WBS	0531	POND SEDIMENTS - LOAD FROM STOCKPILE TO TRUCK
02 00 PRICING BREAKDOW	0520	POND SEDIMENTS REMOVALS

Formula Variables

Global Vanables

Notes

Load-out from Stockpile to Disposal trucks

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 12500161	Power Equipment Operator - Medium	32 00	HR	32 00 1 00	932 16 29 13										932 16 29 13
2 00 1250LAB1	Group I Laborer	32 00	HR	32 00 1 00	655 04 20 47										655 04 20 47
3 00 2500C980	Caterpillar 980 Loader	4 00	DY				3 382 44 845 61								3,382 44 845 61
4 00 50501010	FOGM - (fuel, oil grease maintenance)	280 00	GAL							534 80					534 80
										1 91					1 91
	Sheet Totals	1,421 00	CY	64 00	1 587 20		3 382 44			534 80					5 504 44

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0532 - Verification Sampling

Worksheet Header: **Quantity:** 23.00 **Unit:** EA **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes			Formula Variables
01.00 HTRW/WBS	0532	POND SEDIMENTS - VERIFICATION SAMPLING	Global Variables
02.00 PRICING BREAKDOW	0520	POND SEDIMENTS REMOVALS	

Notes

Verification Sampling - twenty three (23) each.

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1.00 3000LABO	TCLP Metals (23) - Soil	23.00	EA					11,500.00 500.00							11,500.00 500.00
2.00 01000424	Sample Technicians	16.00	HR	16.00 1.00	893.28 55.83										893.28 55.83
	Sheet Totals	23.00	EA	16.00	893.28			11,500.00							12,393.28

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0533 - Disposal Profile Sampling

Worksheet Header: Quantity: 2.00 Unit:EA Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes

01 00 HTRW/WBS	0533	POND SEDIMENTS - DISPOSAL PROFILE SAMPLING
02 00 PRICING BREAKDOW	0520	POND SEDIMENTS REMOVALS

Formula Variables

Global Variables

Notes

Disposal Profile Sampling - Two (2) each

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 3000LABG	Profile Samples	2 00	EA					1,667 40 833 70							1,667 40 833.70
2 00 01000424	Sample Technicians	4 00	HR	4 00 1 00	223 32 55 83										223 32 55 83
	Sheet Totals	2 00	EA	4 00	223 32			1,667 40							1,890 72

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0534 - T&D of Soil and Pond Sediments

Worksheet Header: **Quantity:** 1915.00 **Unit:** TN **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01.00 HTRW/WBS	0534	POND SEDIMENTS - TRANSPORTATION/DISPOSAL
02.00 PRICING BREAKDOW	0600	TRANSPORTATION AND DISPOSAL OF SOILS/WATER

Formula Variables

Global Variables

Notes

1 cy = 1.35 Tons

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1.00 7000DSP3	Transportation and Disposal of Soils	1,915.00	TN								46,189.80				46,189.80
											24.12				24.12
	Sheet Totals	1,915.00	TN								46,189.80				46,189.80

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0535 - Load and Haul Backfill Materials from Borrow

Worksheet Header: **Quantity:** 1 00 **Unit:** LS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes			Formula Variables
01 00 HTRW/WBS	0535	LOAD & HAUL BACKFILL FROM ON-SITE BORROW AREA	Global Variables
02 00 PRICING BREAKDOW	0500	SOILS REMOVAL AREA WORK	

Notes

Load and Haul backfill materials from adjacent on-site borrow area.
Crew Use for four (4) day operation
Two (2) Dump Trucks
One (1) Excavator
One (1) Loader

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 12500160	Power Equip Oper - Heavy	80 00	HR	80 00 1 00	2 361 60 29 52										2 361 60 29 52
2 00 1250LAB1	Group I Laborer	40 00	HR	40 00 1 00	818 80 20 47										818 80 20 47
3 00 1250TRKH	Truck Driver - Heavy	80 00	HR	80 00 1 00	3 099 20 38 74										3 099 20 38 74
4 00 2500CBH2	Caterpillar 330 Tracked Excavator, or Equivalent	4 00	DY				1 257 84 314 46								1 257 84 314 46
5 00 2500C980	Caterpillar 980 Loader	4 00	DY				3,382 44 845 61								3,382 44 845 61
6 00 2500TRAX	Tri-Axle Dump Truck	8 00	DY				3 001 36 375 17								3,001 36 375 17
7 00 50501010	FOGM - (fuel, oil, grease, maintenance)	640 00	GAL							1,222 40 1 91					1,222 40 1 91
	Sheet Totals	1 00	LS	200 00	6,279 60		7,641 64			1,222 40					15,143 64

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0536 - Pond Area - Backfilling & Grading

Worksheet Header: Quantity: 4000 00 Unit:CY Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes			Formula Variables
01 00 HTRW/WBS	0536	POND AREA - BACKFILLING/REGRADING	Global Variables
02 00 PRICING BREAKDOW	0520	POND SEDIMENTS REMOVALS	

Notes

Backfill materials to be obtained from adjacent on-site borrow area
Ponds to be surveyed before and after backfill to determine pay quantity

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 12500160	Power Equip Oper - Heavy	80 00	HR	80 00 1 00	2 361 60 29 52										2 361 60 29 52
2 00 1250LAB1	Group I Laborer	80 00	HR	80 00 1 00	1 637 60 20 47										1 637 60 20 47
3 00 1250TRKH	Truck Driver - Heavy	80 00	HR	80 00 1 00	3 099 20 38 74										3 099 20 38 74
4 00 2500DOZR	John Deere - JD 550 Dozer	4 00	DY				1,095 64 273 91								1,095 64 273 91
5 00 2500VIBR	Vibratory Roller	4 00	DY				2,467 76 616 94								2,467 76 616 94
6 00 2500TRAX	Tri-Axle Dump Truck	4 00	DY				1,500 68 375 17								1,500 68 375 17
7 00 2500WTR1	Water Truck 2000 gl	4 00	DY				670 36 167 59								670 36 167 59
8 00 50501010	FOGM - (fuel, oil, grease, maintenance)	500 00	GAL							955 00 1 91					955 00 1 91
9 00 30000015	Subcontract. Survey Crew	16 00	HR					1 360 00 85 00							1 360 00 85 00
	Sheet Totals	4 000 00	CY	240 00	7 098 40		5 734 44	1 360 00		955 00					15 147 84

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0537 - Site Restoration/Seeding

Worksheet Header: **Quantity:** 2.00 **Unit:** AC **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01.00 HTRW/WBS	0537	SITE RESTORATION AND SEEDING
02.00 PRICING BREAKDOW	0520	POND SEDIMENTS REMOVALS

Formula Variables

Global Variables

Notes

Site Restoration/Seeding
Hydroseeding of two (2) Acres.

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1.00 30000018	Subcontact: - Seeding	2.00	AC					3,215.70 1,607.85							3,215.70 1,607.85
	Sheet Totals	2.00	AC					3,215.70							3,215.70

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 0910 - Site Management

Worksheet Header: Quantity: 1.00 Unit:LS Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes

01.00 HTRW/WBS	0910	SITE MANAGEMENT

Formula Variables

Global Variables

Notes

Start 1 May 2004
End 30 June 2004 - two (2) months.
Site Manager - 9 weeks @ 50 hrs/week = 450 hours

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1.00 10000190	Site Manager	450.00	HR	450.00 1.00	33,664.50 74.81										33,664.50 74.81
2.00 4000PE09	OVA/PID	43.00	DY						1,123.59 26.13						1,123.59 26.13
3.00 4000SEQ1	First Aid Kit	1.00	LS							75.00 75.00					75.00 75.00
4.00 2500PKP1	Pickup Truck - F-150 (1)	86.00	DY				3,533.74 41.09								3,533.74 41.09
5.00 25000001	Port-A-John	2.00	MO					409.68 204.84							409.68 204.84
6.00 2500BKR3	Storage Box (CONEX) / Lockable	43.00	DY				768.41 17.87								768.41 17.87
7.00 2500FTM7	Field Office Trailer 10' x 44' W/OSHA Steps	60.00	DY				730.80 12.18								730.80 12.18
8.00 2500PUM1	2" Diaphragm Water Pump	43.00	DY				256.28 5.96								256.28 5.96
9.00 5025PPE2	Level D Modified	43.00	MAN							940.84 21.88					940.84 21.88
10.00 51000100	Miscellaneous ODCs	10.00	EA							595.50 59.55					595.50 59.55
11.00 5100BWS2	*Drinking Water - Bottled Water*	50.00	EA							408.00 8.16					408.00 8.16
12.00 5100BWS3	Water Cooler	2.00	MTH							95.28 47.64					95.28 47.64

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Line	Resource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
13 00	5100PHN1	Project Phone Service (Mobile)	43 00	DY							512 13 11 91					512 13 11 91
14 00	5100UTY1	Project Utilities (Electrical)	43 00	DY							512 13 11 91					512 13 11 91
15 00	6000PERDIEM	Site Per Diems	45 00	EA			2,235 60 49 68									2,235 60 49 68
		Sheet Totals	1 00	LS	450 00	33 664 50	2,235 60	5 289 23	409 68	1,123 59	3,138 88					45,861 48

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 1000 - Project Admin/Sup Home Office

Worksheet Header: Quantity: 1 00 Unit:LS Estimator: TET Revision: Rev. Date: Start Date: End Date:

Work Codes			Formula Variables	
01 00 HTRW/WBS	1000	PROJECT ADMIN/SUPPORT - HOME OFFICE	Global Vanables	

Notes

Start Project - 1 February 2004
End Project - 31 July 2004 = 6 months

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 01000390	Project Manager	258 00	HR	258 00 1 00	23 978 52 92 94										23 978 52 92 94
2 00 01000102	Procurement Specialist	16 00	HR	16 00 1 00	898 24 56 14										898 24 56 14
3 00 02000030	Accounting Clerk	24 00	HR	24 00 1 00	1 219 92 50 83										1 219 92 50 83
4 00 01000422	Cost Control Person	48 00	HR	48 00 1 00	2 167 20 45 15										2 167 20 45 15
5 00 4010COP1	Copies - Per Copy	1 500 00	EA						105 00 0 07						105 00 0 07
6 00 01000120	Clencal	56 00	HR	56 00 1 00	2 315 04 41 34										2 315 04 41 34
	Sheet Totals	1 00	LS	402 00	30,578 92				105 00						30 683 92

REASOR_C (2064.147.100.1104)
FINAL DESIGN - CONSTRUCTION COST ESTIMATE

Worksheet: 1100 - Project Reporting - Draft & Final

Worksheet Header: **Quantity:** 1.00 **Unit:** LS **Estimator:** TET **Revision:** **Rev. Date:** **Start Date:** **End Date:**

Work Codes

01 00 HTRW/WBS	1100	PROJECT REPORTING - DRAFT & FINAL

Formula Variables

Global Variables

Notes

Work plans to include. Draft & Final

6 copies each

LineResource	Description	Quantity	Unit	Manhours	Labor	Travel	Equipment	Subcontract	Internal	External	T & D	Bnd/Insr	(Not Used)	(Not Used)	Total Cost
1 00 01000390	Project Manager	12 00	HR	12 00 1 00	1 115 28 92 94										1,115 28 92 94
2 00 10000190	Site Manager	24 00	HR	24 00 1 00	1 795 44 74 81										1,795 44 74 81
3 00 01000120	Clerical	24 00	HR	24 00 1 00	992 16 41 34										992 16 41 34
4 00 01000040	CADD Draftsman	16 00	HR	16 00 1 00	782 08 48 88										782 08 48 88
5 00 4010CAD1	CADD Usage	16 00	HR						208 00 13 00						208 00 13 00
6 00 3000REPR	Document Production	2 00	LS							1,429 20 714 60					1,429 20 714 60
	Sheet Totals	1 00	LS	76 00	4 684 96				208 00	1,429 20					6,322 16